5.0 PIPELINE ROUTE

5.0 PIPELINE ROUTE

The route of the pipeline into Site SJ-29 extends northeast from the site's northeast corner, across the saltwater marsh to the Tolomato River (ICWW). The route traverses approximately 3,000 feet of saltwater marsh before intercepting the mean high water line at the property edge. The area is typical saltwater marsh community made up of mud flats and saltwater marsh cordgrass. The area is drained by shallow, meandering tidal streams. Near the proposed pipeline route are two islands; one low island with open sand areas, and Little Pine Island, which is covered with live oak and pine forest.

6.0 JURISDICTIONAL WETLANDS

6.0 JURISDICTIONAL WETLANDS

The two areas of mixed wetland forest (630) along the north central site boundary (Figure 3-1), and the saltwater marsh (642) along the eastern site boundary are likely jurisdictional areas regulated by the Department of Environmental Regulation (DER) and the U.S. Army Corps of Engineers (COE). The forested wetlands in the north central part of the property are only partially on Site SJ-29 and connect through other wetlands to Marshall Creek. The isolated wetlands along the south property line (643) and the central trail (620) are likely to be considered jurisdictional by the St. Johns Water Management District (SJWMD) and COE. The ephemeral wetlands (643) in the north central areas are less than one-half acre and are not normally regulated by SJWMD.

7.0 REFERENCES

7.0 REFERENCES

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APPENDIX II

ENGINEERING NARRATIVE AND SITE MAPS

Engineering Narrative
SJ-29 Disposal Area

This narrative is a summary of the documents which comprise the permit application package submitted to obtain a long-term dredge/fill permit for the development of the SJ-29 dredged material disposal area. It is intended that site SJ-29 will be a permanent facility to service the maintenance requirements of Reach III of the Intracoastal Waterway (ICWW) in St. Johns County, Florida from the vicinity of Deep Creek in northern St. Johns County to the Bridge of Lions in St. Augustine (ICWW mile 25.47 to mile 37.71). The submission of this application package represents an intermediate step towards the completion of the second phase of a two phase program element addressing the maintenance requirements of the Intracoastal Waterway in St. Johns County, Florida. This element is part of a fifteen year program sponsored by the Florida Inland Navigation District to develop a long-term dredged material management plan for the Intracoastal Waterway along the entire east coast of Florida. Phase I of the St. Johns County program element, which is documented in three reports included as Attachments 1, 2, and 3 to this permit application, developed basic plan concepts for the continuing management of maintenance material dredged from the Intracoastal Waterway in St. Johns County, defined short and long term program needs based on a comprehensive examination of historical dredging records for the project area, and identified suitable centralized sites which satisfy these needs based on preliminary environmental, engineering, and operational criteria. Phase II consists of the gathering of detailed, site-specific information required for the preparation and submission of permit applications for the five primary disposal sites identified in Phase I. In addition, Phase II also addresses the design of the site disposal facilities; the acquisition of these sites, through negotiated purchase or condemnation, by the Florida Inland Navigation District; and the construction and continuing operation and maintenance of these sites as permanent dredged material management facilities.

No attempt is made in this narrative to recount, in detail, the information contained in the documents which accompany the permit application. Rather, this narrative is designed to assist the reviewer in organizing this information, while emphasizing the engineering considerations and design specifications presented in the attached permit drawings. In addition to the permit drawings and the Phase I reports already mentioned, the documents which comprise the permit application package for site SJ-29 include: (1) a boundary survey for the disposal site, providing completeness, as well as the legal description necessary for acquisition; (2) a topographic survey, documenting pre-construction topography and drainage patterns, and providing information necessary for site design, volumetric calculations, and grade analysis; (3) the sub-surface and soils report, identifying site foundation conditions and in-situ construction material suitability, as well as locating the water-table on-site; (4) the environmental report, documenting existing environmental conditions, including vegetation communities and wildlife habitats, and serving to guide the configuration of the containment area within the site so as to avoid, to the greatest extent possible, the most sensitive environmental areas; and (5) a site-specific management plan, insuring that the disposal area will continue to be operated in an efficient manner without undue conflicts

with adjacent off-site land use, and allowing the site to be maintained as a permanent facility. It is hoped that the information contained in this permit application package will provide for the granting of a long-term permit in keeping with the long-range goals of the project.

Site SJ-29 is an area of 48.85 acres located in northeast St. Johns County. It lies adjacent to the north branch of Stokes Creek, approximately 0.60 miles west of the Tolomato River (Attachment 4, Sheet 1 of 5). It lies within an extensive private landholding, the major portion of which is slated for residential development. The area is vegetated by pine-mesic oak, pine flatwoods, sand pine, xeric oak, and various wetland communities. The maximum site elevation, +19.2 ft NGVD, occurs in the extreme southwest corner. From this point the topography generally slopes to the northeast and is marked by a series of low prehistoric dunes commonly found along the northeastern coast of Florida. A broad tidal marsh associated with the northern branch of Stokes Creek borders the proposed disposal site to the east. Soils on the site consist mainly of a mixture of Tavares-Zolfo and Sparr sands, with some Cassia fine sand also present. Though documented archaeological sites are present in the vicinity, no historical or archaeological sites are recorded for this property, based on a review of the Florida Master Site File.

Detailed environmental information for site SJ-29 is provided in the attached environmental report (Attachment 8). Notable on-site features include two areas of mixed forested wetland, totalling 0.4 acres (Attachment 4, Sheet 5 of 5). These areas are potentially under the permit review authority of the Florida Department of Environmental Regulation. Several isolated wetlands are also present, including a 0.4 acre isolated coniferous forest wetland and three isolated wet prairies, totalling 0.3 acres. The largest of the wet prairies lies along the southern boundary of the site and extends into the adjoining properties where it has been modified as a result of residential development there. All of the isolated wetlands on site are potentially under the permit review authority of the St. Johns River Water Management District. In addition, a 0.1 acre salt marsh area lies near the middle of the eastern site boundary adjoining the extensive off-site salt marsh associated with Stokes Creek. This area is potentially under the permit review authority of the Florida Department of Environmental Regulation.

In order to minimize the environmental and socioeconomic impact on the surrounding areas, a 300 foot buffer of undisturbed vegetation will remain on the north, west and south sides of the site to separate the containment area from adjacent properties (Attachment 4, Sheets 3 and 5 of 5). A similar buffer to the east of 300 feet or more is included to separate the basin from the edge of the Stokes Creek tidal marsh (i.e., approximate MHW). The dikes are configured such that all of the mixed forested wetlands (0.4 acres) and 0.3 acres of the 0.7 acres of isolated wetlands on-site are within the buffer area. These areas will therefore not be impacted by containment basin construction.

The proposed disposal area is defined by earthen dikes to be constructed of material excavated from the site interior. The existing mean elevation of the projected disposal area was determined from topographic survey (Attachment 6) to be +8.30 feet NGVD. Specific soil and foundation information (soils/sub-surface report, Attachment 7) confirm the utility of the preliminary facility design as being well within the range of standard U.S. Army Corps of Engineers (COE) practice for similar sites and materials. Design dike specifications include a dike crest height of +10.0 ft above grade (+18.3 ft NGVD), a side slope of 1V:3H, and a crest width of 12.0 ft, yielding a dike width at grade of 72.0 ft. As measured at the crest centerline, the dike perimeter is 2923 ft, requiring 45,469 c.y. of material to construct.

An additional feature of the containment structure is a ramp to allow ingress and egress of heavy equipment to and from the interior of the containment area. Ramp details are shown in Attachment 4, Sheets 2 and 3 of 5. The outside slope of the ramp and the slope of the supporting toe maintain the same 1V:3H slope as the main dike. The ascending/descending grade is 4 per cent. These ramps, which allow removal of the dewatered dredged material, reinforce an important program concept as detailed in the Phase I reports. That is, although the containment area is designed to provide capacity adequate to serve the projected 50-year requirement of a designated reach of the Waterway, it is also designed to be a permanent operating facility. Prior to reaching design capacity, the ramps, in association with operational procedures detailed in the site-specific management plan (Attachment 9), will provide for the efficient removal of material for use as dictated by prevailing restrictions and market conditions.

The total volume of material required for ramp construction is 2,086 c.y., which when added to the dike requirement of 45,469 c.y. yields a total construction material requirement of 47,555 c.y. This is to be provided by uniform excavation of the interior containment area to a depth of +5.3 ft NGVD (3.0 ft below grade), while maintaining the above grade interior dike side slope (Attachment 4, Sheet 3). Allowing for 2.0 ft of freeboard, and an additional 2.0 ft of ponding depth at the completion of final dredging operations (i.e, filling the containment area to 4.0 ft below the dike crest, or +8.0 above the interior grade) yields a total site disposal capacity of 146,751 c.y. While this volume greatly exceeds the projected 50-year Reach III disposal requirement of 8,769 c.y., it insures that material from future increases in dredging activity can be accommodated. It should be noted that this disposal requirement represents the 50-year projected in-situ volume multiplied by a bulking plus over-dredging factor of 2.15. Also to be noted is the existence of the on-site water table located at a mean elevation of +6.18 ft NGVD, or 0.86 ft above the excavation grade, at the time of the sub-surface survey. Therefore, a sump and/or pumping of groundwater seepage may be required during construction.

The dredged material will be transported to the disposal area via a pipeline extending southwest from the Tolomato River to the northeast corner of the site, traversing approximately 3,000 feet of tidal marsh

(Attachment 4, Sheet 1 of 5). Within the disposal site, the inlet pipeline is to be routed along the east and south sides of the containment basin to enter the basin in its southwest corner by passing over the dike crest (Attachment 4, Sheet 2 of 5).

Decanting of the ponded water will be accomplished by a parallel arrangement of four (4) corrugated metal half-pipes, located in the northeast corner of the containment area, diagonally opposite the slurry inlet. Each half-pipe will provide for the release of effluent over a sharp-crested weir section of minimum length of 9 ft, for a total minimum crest length of 36 ft. The weir crest height will be adjustable by means of removable flash boards from +8 ft above grade to below grade. The four weirs are to be connected by a manifold, with a single outlet pipe passing under the dike, returning the supernatant to state waters, utilizing the pipeline route and easement described above.

The specification of a minimum weir crest length of 36 ft is based on U.S. Army Corps of Engineers guidelines related to the dredge equipment. For this and all project calculations, it has been assumed that a 24 inch O.D. dredge, (discharge velocity of 16 ft/sec, a volumetric discharge of 6430 c.y./hr, and a 20/80 solids/liquid slurry mix) would be used for future channel maintenance. However, the physical constraints of the channel will most likely dictate the use of a 16 to 18 inch O.D. dredge. Therefore, the assumption of a 24 inch dredge insures a conservative design. Analysis of weir performance based on nomograms developed at the COE Waterways Experiment Station (WES) under the Dredged Material Research Program (DMRP) (Walski and Schroeder, 1978) indicates that these design parameters may be expected to produce an effluent suspended solids concentration of 0.63 g/l, assuming an average ponding depth of 2 ft. Translation of suspended solids concentration to a measure of turbidity on which Florida water-quality standards are based is highly dependent on the suspended material characteristics. However, WES guidelines (Palermo, 1978) indicate that this effluent quality should be adequate. Should effluent quality deteriorate below the ambient conditions of the receiving waters, steps shall be taken to decrease effluent turbidity. These include intermittent dredge operation, increased ponding depth, or the use of turbidity curtains surrounding the site outlet weirs.

Finally, as part of this application an analysis of containment area efficiency was performed. Since no sediment sampling has been carried out in the reach of the ICWW to be served by the SJ-29 disposal area, the analysis was based on the characteristics of sediments obtained from core boring CB-IW85-6, made in the vicinity of Matanzas Inlet in July, 1985. The boring logs, grain size distribution and suspended sediment-time curves, presented in Sheet 4 of 5 of the permit application drawings, provide an accurate representation of the sediments likely to be encountered during dredging in Reach III. Analysis of these data indicates that the containment area provides adequate retention time to allow the sediment to settle out of the average ponding depth of 2 ft (6.22 hrs maximum retention time vs. 0.04 hours required settling time multiplied by a safety factor

of 3, or 0.12 hrs). Moreover, the WES-DMRP guidelines indicate that for the minimum design weir loading (i.e, liquid discharge/weir crest length) of 1.07 cfs/ft, the withdrawal depth (i.e, the depth at which the gravity forces on a suspended sediment particle exceed the inertial forces) ranges from 0.67 ft based on empirical results, to 2.11 ft based on the WES Selective Withdrawal Model. It should be noted that even the larger of these values should not result in the resuspension of sediment because of the negative slope of the deposition layer from inlet to weir, which results in ponding depths at the weir greater than the 2 ft average ponding depth over the entire containment area.

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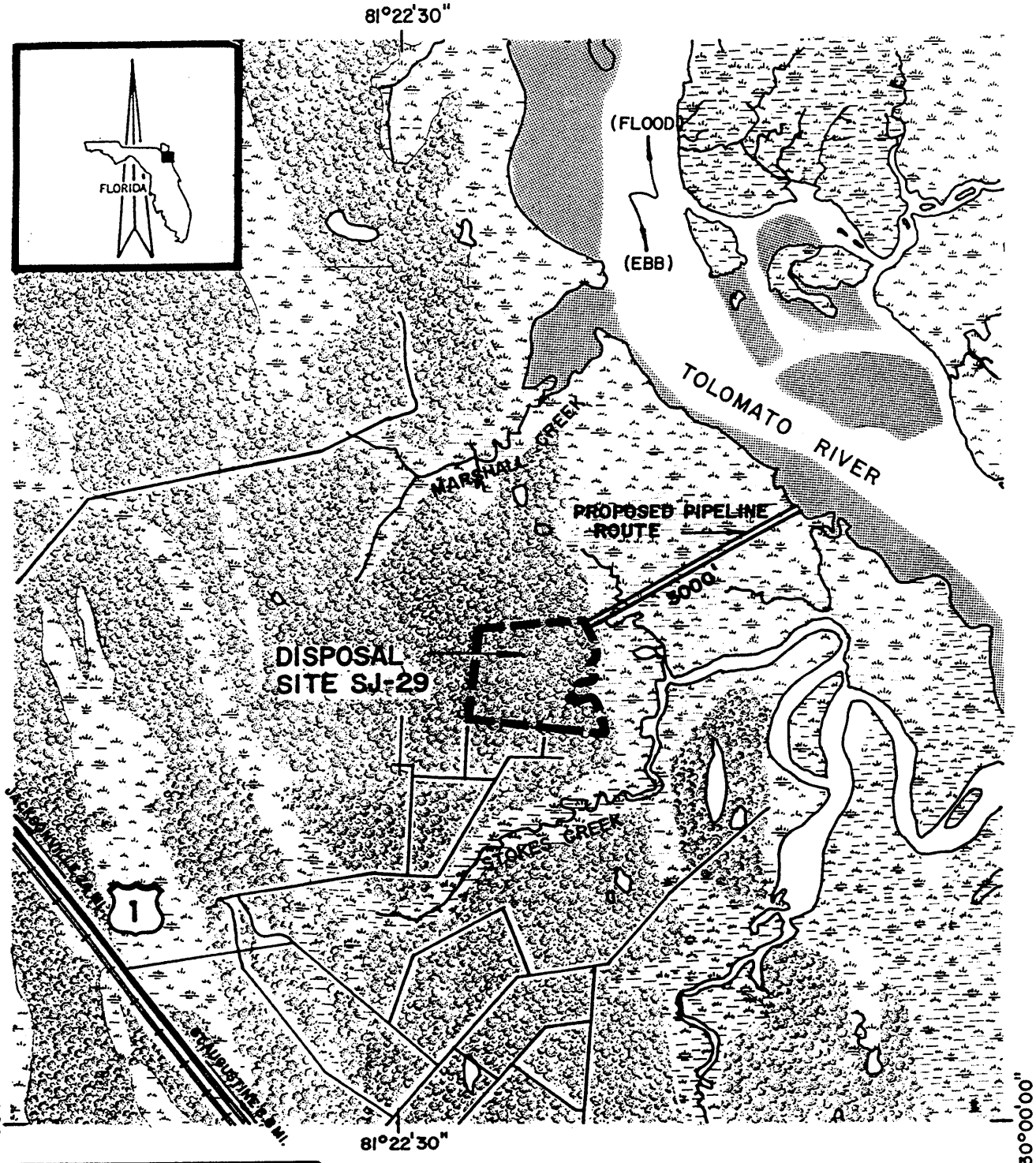

REFERENCED

USGS DURBIN, FL. QUADRANGLE 1952, PHOTOREVISED 1970.
USGS S.PONTE VEDRA BCH., FL. 1952, PHOTOREVISED 1970.

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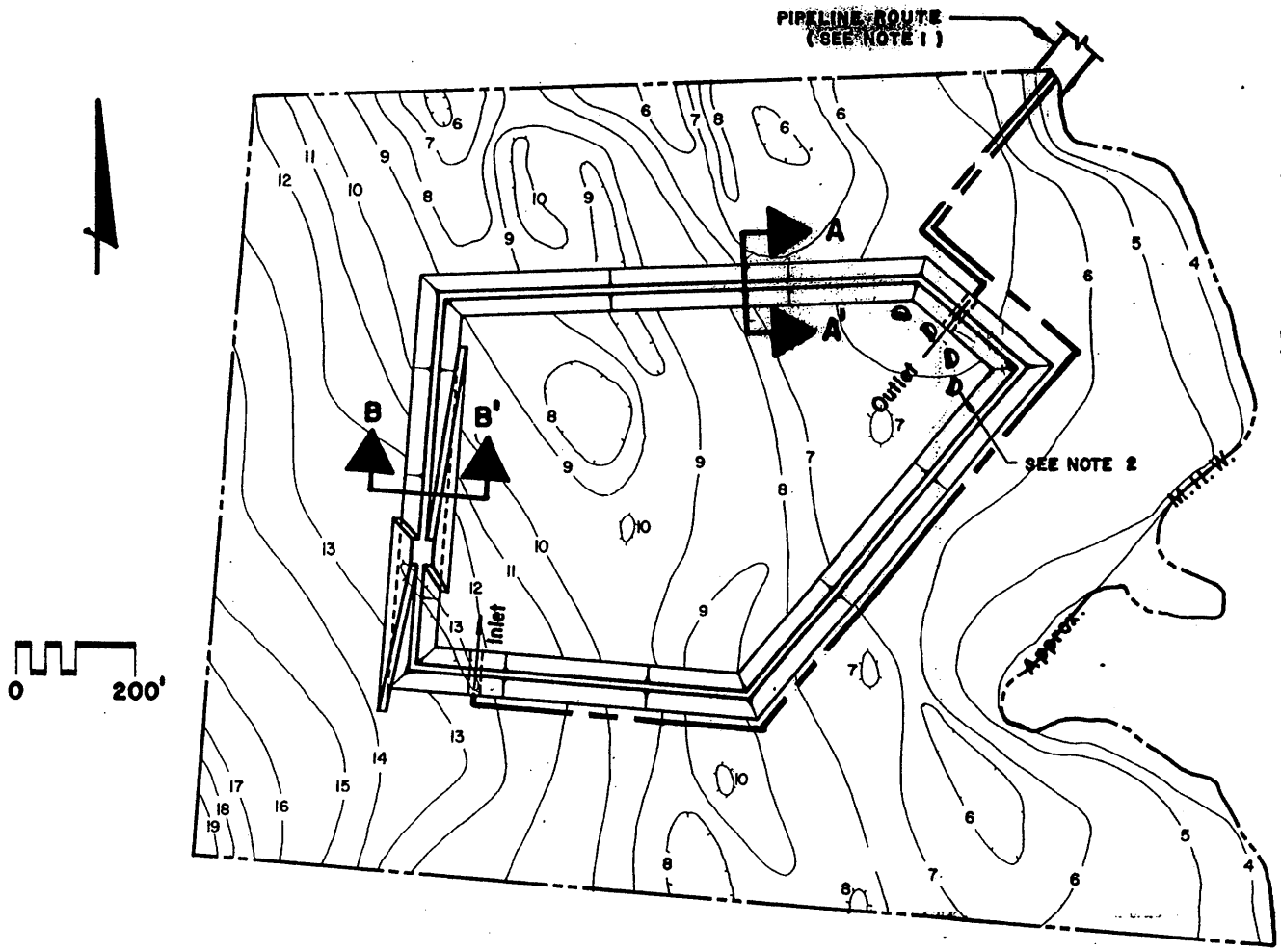
Location of Dredged Material Disposal Site SJ-29
St. Johns County, Florida

PROJECT	C-9003
REVISION	
SHEET	1 of 5
DATE	Sept. ,1991



NOTES:

1. PIPELINE ROUTE (WIDTH 60', LENGTH 3000') TO RUN FROM R/W I.C.W.W. TO SITE BOUNDARY (M.H.W.); PIPELINE PLACEMENT WILL REQUIRE THE CROSSING OF 3000' OF SALT MARSH.
2. WEIRS: FOUR 9-15' DIA. CM HALF-PIPES W/ REMOVABLE FLASH BOARDS ADJ. FROM 4 15 FT. ABOVE GRADE TO BELOW GRADE (W/CONNECTING MANIFOLD.)
3. CONTAINMENT AREA:
   WITHIN OUTSIDE TOE OF DIKE: 14.75 AC.
   WITHIN INSIDE TOE OF DIKE: 9.92 AC.
   CAPACITY: 146,751 C.Y.
4. SECTION A-A', B-B' SEE SHEET 4 of 6.
5. ELEVATION DATUM: NGVD of 1929
6. AREA OUTSIDE DIKE WITHIN SITE BOUNDARY TO BE A BUFFER OF NATURAL VEGETATION.

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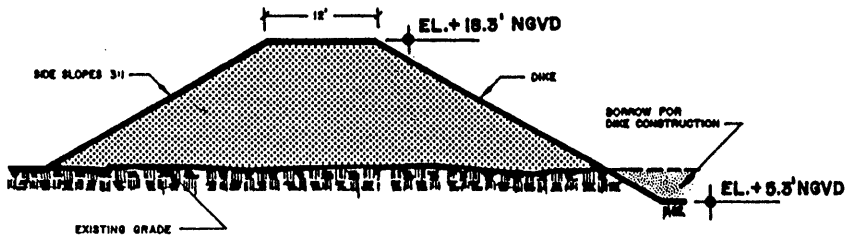
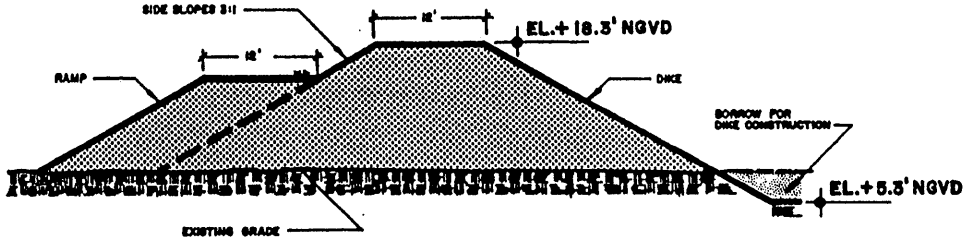
Disposal Area Site Plan
Site SJ-29
St. Johns County, Florida

PROJECT	C-9003
REVISION	
SHEET	2 of 6
DATE	Sept. , 199



SECTION A-A'
N.T.S.



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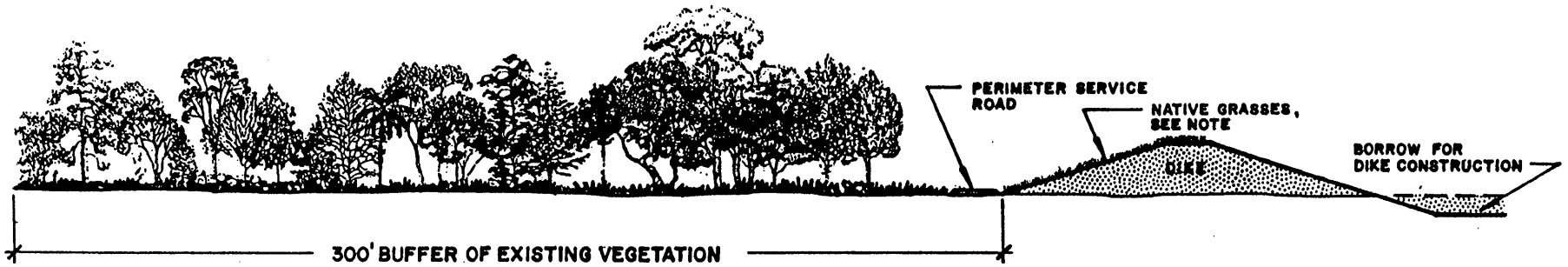

NOTE:
TYPICAL SPECIES INCLUDE:
PASPALUM VAGINATUM
SPARTINA PATENS
SPOROBOLUS SPECIES

DISPOSAL AREA - VEGETATION PLAN
SCALE 1" = 50'

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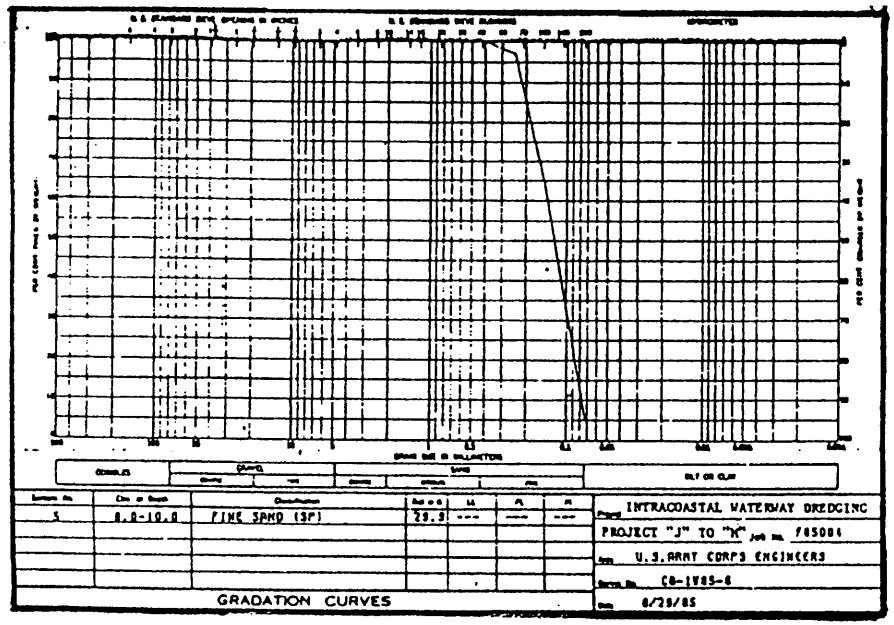
Typical Dike and Ramp Sections, Vegetation Plan
Site SJ-29
St. Johns County, Florida

PROJECT C-9003
REVISION
SHEET 3 of 5
DATE Sept. ,1991



Sample No.	Elev. or Depth	Description	Nat. w %	LL	PL	PI
S	8.0-10.0	FINE SAND (SP)	29.9	---	---	---

Project: INTRACOASTAL WATERWAY DREDGING
PROJECT "J" TO "M" Job No. F85004
Boring No. CB-1W85-6
Date: 8/29/85

GRADATION CURVES

THOMPSON ENGINEERING TESTING, INC.
SIEVE AND HYDROMETER ANALYSIS
ASTM D422

PROJECT : JACKSONVILLE DISTRICT
CLIENT : U.S.ARMY CORPS ENGINEERS
BORING NO. CB-1W85-6
SAMPLE NO. S

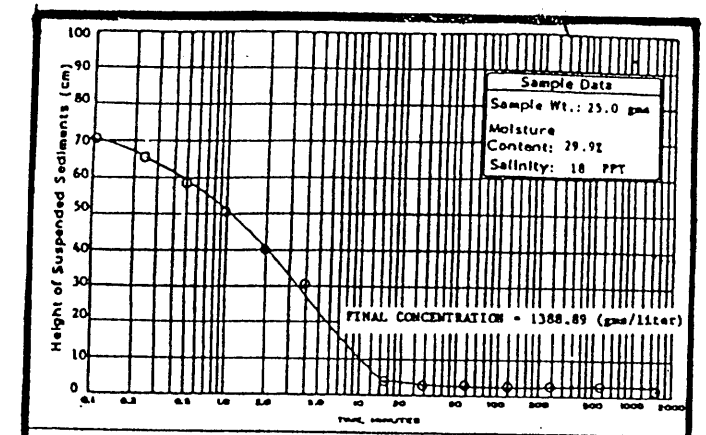
OUR JOB NO.: F85004
ANALYSIS DATE : 8/29/85
SAMPLE WT. 81.23 GMS.
DEPTH 8.0-10.0 FT.

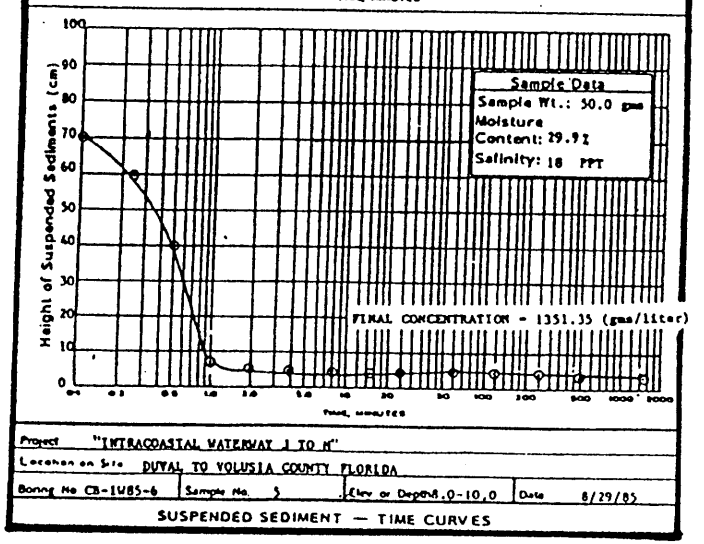
SIEVE ANALYSIS

SIEVE NUMBER	SIEVE DIA.(MM)	CUMMULATIVE WEIGHT RETAINED	PERCENT RETAINED	PERCENT PASSING
4	4.75	0	0	100
10	2	0	0	100
20	.85	.1	.1	99.9
40	.425	.3	.4	99.6
60	.25	2.8	3.4	96.6
100	.15	28.9	35.6	64.4
200	.075	77.3	95.2	4.8

GRAVEL OR SHELL, PASSING 3IN. AND RETAINED ON NO.4 SIEVE----------0%

SAND, PASSING NO.4 SIEVE AND RETAINED ON NO.200 SIEVE----------95.2%
--COARSE SAND, PASSING NO.4 SIEVE AND RETAINED ON NO.10 SIEVE------0%
--MEDIUM SAND, PASSING NO.10 SIEVE AND RETAINED ON NO.40 SIEVE------.4%
--FINE SAND, PASSING NO.40 SIEVE AND RETAINED ON NO.200 SIEVE------94.8%





Project "INTRACOASTAL WATERWAY J TO M"
Location of Site DUVAL TO VOLUSIA COUNTY FLORIDA
Boring No CB-1W85-6 | Sample No. S | Elev or Depth 8.0-10.0 | Date 8/29/85

SUSPENDED SEDIMENT — TIME CURVES

THOMPSON ENGINEERING TESTING, INC.
SIEVE AND HYDROMETER ANALYSIS
ASTM D422

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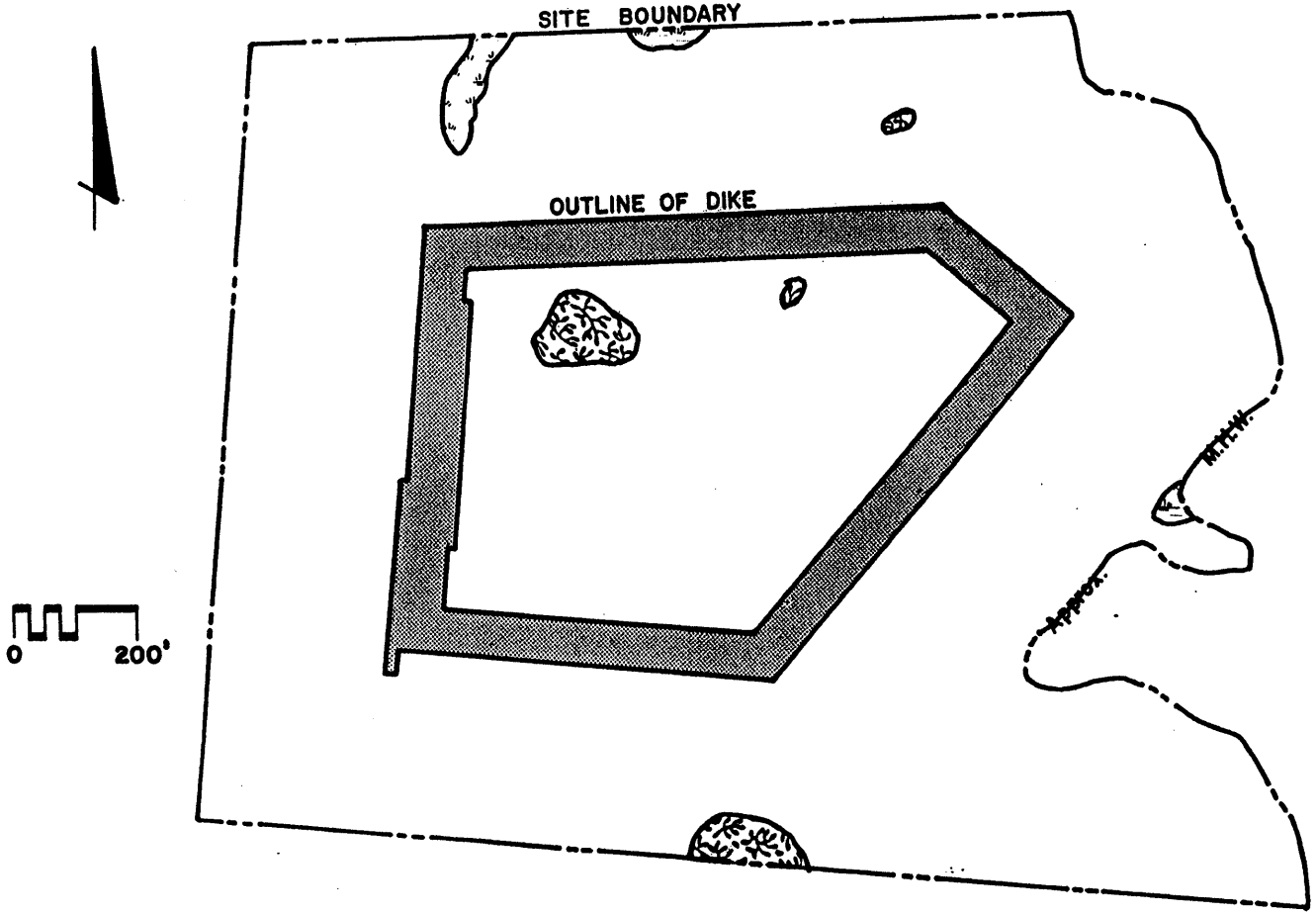
Sediment Data for Core Boring
CB-1W85 - 6

PROJECT C-9003
REVISION
SHEET 4 of 7
DATE Sept. , 1991



NOTES :

1. Area of D.E.R. Jurisdictional Wetlands on Site: 0.5 Ac.
   Area of D.E.R. Jurisdictional Wetlands Impacted: 0.0 Ac.
2. Area of Isolated Wetlands on Site: 0.7 Ac.
   Area of Isolated Wetlands Impacted: 0.4 Ac.

LEGEND

- DER JURISDICTIONAL WETLANDS
- ISOLATED WETLANDS

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JACKSONVILLE, FLORIDA 32256

Disposal Area Wetlands Map
Site SJ-29
St. Johns County, Florida

PROJECT C-9003
REVISION
SHEET 5 of 5
DATE Sept. ,1991

APPENDIX III

SITE MANAGEMENT PLAN

Management Plan
SJ-29 Disposal Area

September, 1991

Management Plan
SJ-29 Disposal Area

September, 1991

Prepared For:
FLORIDA INLAND NAVIGATION DISTRICT

by:

R. Bruce Taylor
William F. McFetridge
Michael L. Cochrane

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(904) 731-7040

TABLE OF CONTENTS

LIST OF FIGURES